

1 **CONSOLE DISPLAY FOR PERSONAL COMPUTERS**

2 BACKGROUND OF THE INVENTION

3 1. Field of the Invention

4 The present invention relates to a console display for personal computers,
5 especially to a display device installable on a personal computer to track the
6 operation conditions of critical components by displaying related operation data
7 through a display window on the face panel of the computer.

8 2. Description of Related Arts

9 To cope with increased sophistication in our daily life, more and more
10 people have to rely on personal computers to support their regular business
11 functions. A personal computer is generally constructed with an input unit, a
12 main processing unit, and a display unit. However, for novice users with no
13 adequate knowledge of the operating principles and the hardware, computers are
14 not that friendly at all, and have been known to exasperate many users.

15 Analyzing the common hardware problems, failure of the cooling fans or
16 overheating of the central processors (CPU) are among the most frequently
17 encountered by computer users. The operating conditions of these hardware
18 components cannot be easily monitored when the computer is in operation
19 because these components are usually installed inside the casing. In fact, it is
20 almost impossible, even for an experienced user with a technical background, to
21 predict any hardware problems before the component actually fails. For a
22 computerized operation system, such a failure could be quite costly, in terms of
23 the potential data lost, the system down time, and the hardware replacement
24 costs.

1 One of the ways to prevent the above-mentioned hardware failures is to
2 install a console display on the face panel of the computer, such that the computer
3 user can track the operation conditions of critical components through a display
4 window on a continuous basis, and detect any early signs of any developing
5 hardware problems and take precautionary actions for emergencies in advance of
6 actual hardware failures.

7 SUMMARY OF THE INVENTION

8 The main object of the present invention is to provide a console display
9 for personal computers, which is installable on a personal computer to provide
10 users with continuous information with regard to the operation status of critical
11 components in the computer, such that the user can identify early signs of any
12 developing hardware problems, and take precautionary actions for emergencies
13 or shut down the system for a maintenance check.

14 To this end, the present invention makes use of a display console
15 installable on the face panel of the host computer, with a signal detection circuit
16 and a dial meter, to track the operation data values of critical components in the
17 host computer, wherein the signal detection circuit is connected to a specific
18 hardware component in the host computer for retrieving operation data, and the
19 operation data values are displayed through a dial meter installed on the face
20 panel of the host computer.

21 The specific hardware component in the host computer connectable to
22 the console display, in accordance with the present invention, can be a cooling
23 fan. In this case, the signal detection circuit becomes a revolution count circuit
24 connected in between the cooling fan and the dial meter, to check the revolution

1 per minute (rpm) of the fan and output the operation data values to the dial meter,
2 such that the computer user is able to track the operation status of the cooling fan.

3 The specific hardware component in the host computer connectable to
4 the console display, in accordance with the present invention, can also be a sound
5 controller or a sound card. In that case the signal detection circuit is an output
6 amplitude signal detection circuit connected to the line output of the sound
7 controller or sound card to check the magnitude of the output signal and then
8 output a drive signal to the dial meter for displaying the magnitude of the output
9 signal, such that the computer user is able to track the operation status of the
10 sound controller or sound card.

11 The specific hardware component in the host computer connectable to
12 the console display, in accordance with the present invention, can also be a
13 central processor. In that case, the signal detection circuit is connected to a
14 temperature detection circuit located in close proximity to the central processor.
15 The operating temperature of the central processor will be continuously recorded
16 by the temperature detection circuit and output to the dial meter for displaying
17 the temperature values to the computer user, such that the computer user is able
18 to track the operating temperature and the operation status of the central
19 processor.

20 Through the console display, the computer user can be aware of the
21 operation statuses of critical hardware components in the host computer. The
22 selection of target components is based on an analysis of the probability of failure
23 for critical components in the host computer. The continuous tracking of the
24 operation of critical components allows the computer user to avoid any abnormal

1 situations that could lead to hardware failures and so take precautionary actions
2 in advance. The console display installable on the face panel of a personal
3 computer not only provides the practical functions as mentioned above, but also
4 adds to the decorative effect on the face panel of the computer.

5 The features and structure of the present invention will be more clearly
6 understood when taken in conjunction with the accompanying figures.

7 BRIEF DESCRIPTION OF THE DRAWINGS

8 Fig. 1 is an exploded view of the present invention;

9 Fig. 2 is a rear view of the present invention from the back of the face
10 panel;

11 Fig. 3 is a schematic of the revolution count circuit;

12 Figs. 4A-4B are a schematic of the audio signal detection circuit;

13 Fig. 5 is a schematic of the temperature detection circuit; and

14 Fig. 6 is an example of the present installation in a personal computer.

15 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

16 The present invention provides a console display installable on the face
17 panel of a personal computer to track the operation status of specific hardware
18 components inside the host computer by displaying the metered operation data
19 values through a display window.

20 The structure of the present invention is shown in Figs. 1 and 2. The
21 console display is a display device (20) installable on the back side of a face
22 panel (10) in a host computer making connection with specific hardware
23 components in the host computer. There is a display window (11) on the face
24 panel (10) of the host computer for displaying the metered operation data values

1 The display device (20) comprises:
2 a signal detection circuit (not shown in the diagrams) being set up on a
3 circuit board (21) with an L point connected to a specific hardware component to
4 retrieve the operation status of the hardware component;
5 a dial indicator (22) being connected to the output of the signal detection
6 circuit to display the metered operation data values through a display window (11)
7 on the face panel (10) reflecting the operation status of a specific hardware
8 component; and
9 a power circuit (23) being installed on a circuit board (21), which
10 converts the input power to an appropriate voltage to supply the operation
11 requirements of the signal detection circuit and the dial indicator (22). The power
12 circuit, as shown in Fig. 3, includes a voltage divider with R1/R2 structure, to
13 provide operating voltages (V1, V2) to the signal detection circuit and the dial
14 indicator (22).

15 The circuit diagram of the display device shown in Fig. 3 is used to track
16 the rpm of the cooling fan, wherein the related signal detection circuit is a
17 revolution counting circuit (30) formed by a variable voltage regulator (31). The
18 reference voltage pin 3 of the variable voltage regulator (31) is grounded through
19 a variable resistor VR301, used for changing voltage values. The input pin 1 of
20 the variable voltage regulator (31) is connected to the output of the power circuit
21 V1. The output pin 2 of the variable voltage regulator (31) is respectively
22 connected to the power input and the input of the dial indicator (22) to track the
23 variations in output voltage of the cooling fan, so as to determine the rpm of the
24 cooling fan and output the metered operation data values to the dial indicator (22),

1 reflecting the continuous operating status of the cooling fan.

2 The circuit diagram of the display device as shown in Figs. 4A-4B is
3 used for tracking the output amplitude of a sound controller or sound card,
4 wherein the related signal detection circuit is formed by an audio signal detection
5 circuit (40) with a signal processor U1, which is connected in between the line
6 out of the sound controller or the sound card and the dial indicator (22). The
7 signal processor U1 is able to check the amplitude of the output audio signal to
8 determine the magnitude of the output sound, and output the metered operation
9 value to the dial indicator (22), reflecting the continuous operating status of the
10 sound controller or sound card.

11 The circuit diagram of the display device shown in Fig. 5 is used for
12 tracking the operating temperature on the surface of the central processor. The
13 related signal detection circuit is a temperature detection circuit (50), including:

14 a temperature detector (51) to detect variations in the surface
15 temperature of the central processor and output a drive signal to the dial indicator
16 (22), wherein the temperature detector (51) can be installed at a location in close
17 proximity to the central processor; and

18 a voltage regulator (52) to provide operating voltage to the temperature
19 detection circuit (50), wherein the voltage regulator (52) is connected in between
20 the power circuit (23) and the temperature detector (51), formed by a resistor
21 R202, a variable resistor VR201, and a Zener diode ZD1.

22 In accordance with the present invention, the output of the above
23 mentioned voltage regulator (52) is grounded through a resistor R201 and
24 connected to the dial indicator (22), to detect the variations in voltage and output

1 drive signals to the dial indicator (22), reflecting the continuous operating
2 temperature recorded by the temperature detector (51).

3 From the foregoing, the present invention can be implemented with
4 several types of signal detection circuits as mentioned above to check the
5 operation status of specific hardware components inside the host computer, and
6 the metered operation data values can be displayed to the computer user on a
7 continuous basis through a display window on the face panel of the host
8 computer, as shown in Fig. 6, such that the computer user is able to monitor the
9 operating status of critical components and identify early signs of any developing
10 hardware problems. For users possessing a hardware background, this
11 information can be useful for taking precautionary actions for emergencies or
12 shutting down the computer for a maintenance check. For users without a
13 hardware background, this information offers a learning experience in working
14 with the personal computer. Furthermore, the addition of a display window on
15 the face panel of the personal computer not only provides the practical values
16 mentioned above but also adds to the decorative effect on the face panel of the
17 personal computer.

18 The foregoing description of the preferred embodiments of the present
19 invention is intended to be illustrative only and, under no circumstances, should
20 the scope of the present invention be so restricted.